Distribution of Practice on Cup Stacking Performance
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Abstract

Thirty undergraduate students (ages 19-27 yrs) volunteered to participate in this study and were randomly assigned to a practice schedule.  
• Massed = 60 consecutive minutes
• Distributed = 3 X 20 minute sessions
• Control = no practice schedule assigned

Practice groups watched video (Speed Stacks Stacker Training DVD) on cup stacking at the beginning of each session
• Participants performed timed progression stacking sequences (3, 3-3, 3-3-3, 6, 3-6-3) (Figure 1).
• Participants were measured for reaction time (RT) during pre and post trial sessions using the Johnson & Nelson (1986) reaction time test (as used by Udermann et al., 2004).  

Transfer test (6-6 stacking sequence) was conducted after completing 60 minutes of practice (Figure 2).  
• Dependent variables included time to complete 6, 3-6-3, and 6-6 sequences and RT

3 (group) X 2 (test) mixed ANOVA with alpha = .05 was used for reaction time statistical analysis.
• Reaction Time Results (refer to Figure 3)

Results

Significant Group (massed, distributed, control) X Test (pre, post) interaction was identified,
F(2,27)=8.910, p<.05.

• Significant Group main effect (F(1,18)=9.318, p<.05) found between the pre and post RT tests

• For the control group, no significant difference was found between the pre and post RT tests

• No significant RT difference between massed and distributed groups

Stacking Time Results (refer to Figure 4)
• Significant Group main effect (F(1,18)=9.318, p<.05)

• Faster stacking times exhibited for the distributed group

• No significant Group x Sequence interaction, F(2,36)=3.3, p>.05

• Distributed group was faster on all stacking sequences

Discussion

According to the manufacturer of Speed Stacks, there are a number of positive benefits gained as a result performing cup-stacking.  Speed Stacks Inc. claims that cup stacking promotes and increases hand-eye coordination, quickness, reaction time and ambidexterity (“Building team skills,” n.d.).  Although Speed Stacks, Inc. has made claims that the task will enhance motor skills, there is limited empirical evidence that can support their case.  One study, however, was conducted by Udermann et al. (2004) to investigate if cup stacking influenced hand-eye coordination and reaction time in second grade students.  They found that cup stacking positively affected hand-eye coordination and reaction time in the participants rationalizing that it would also help students to become more proficient in motor skills, movement, and physical activities.  Hart and Bixby (2005) found that both sides of the brain were active during cup stacking.

What is the most effective way to practice cup stacking?  To date, no studies have been performed to examine various distributions of practice while cup stacking.  Practice distribution has been investigated on its appropriateness to applied settings in a variety of contexts.  To ensure optimal performance and learning in motor skills, researchers question as to whether massed or distributed practice is more beneficial (Lee & GenOVESE, 1989).  Researchers also question the benefits of distribution of practice for the acquisition of motor skills in relation to the type of motor skill, such as discrete, continuous, or serial skills.  Although there are no standards for the number or duration of practice sessions, general results indicate that distributed practice leads to better learning (Magill, 2004).

According to Lee and Genovese (1988) and Denny, Frisby and Weaver (1955) distributed schedules lead to better learning than massed schedules for learning continuous motor skills.  In contrast, Carron (1969) examined discrete skills and found that massed practice showed more improvement in learning than distributed practice.  When examining serial skills such as cup stacking, limited research has been done.

Conclusions

• Distributed practice enhances performance and learning of the serial skills of cup stacking.

• Even 60 minutes of cup stacking practice can improve reaction time in young adults.

REFERENCES
Udermann, B. E., Mayer, J. M., Murphy, S. R., & Hart, M. A. (2004, December 10). Stacking Time Results (refer to Figure 4)


Undermann, B. E., Mayer, J. M., Murphy, S. R., & Hart, M. A. (2004, December 10). Stacking Time Results (refer to Figure 4)